



# NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
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UNIVERSITY OF DELAWARE COMMENCEMENT  
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A few days ago, addressing his colleagues in the United States Senate, the distinguished chairman of the Committee on Aeronautical and Space Sciences, Senator Clinton Anderson, spoke eloquently of the significance of our national space effort to this and future generations.

"Space is a place," Senator Anderson said. "Those of us who only stand on the fringe of scientific knowledge still appreciate that this place called space is a new sea whose shores are not completely charted, whose depth remains largely unmeasured, and whose significance will best be understood by generations yet to come."

Senator Anderson went on to say that:

"As surely as the ancient mariners ventured across unmapped seas, as certainly as explorers opened our own West, and men established bases at the barren and inhospitable poles, we are going to continue this bold journey through space with all of its direct and side benefits to this generation and those which come after."

Senator Anderson pointed out that "space is a place." In speaking to you who are about to graduate today, I would like to talk about your place in space, and the opportunities which are opening to you as earthly creatures embark, for the first time in the long history of mankind, beyond the restricting influence of the earth's gravity and atmosphere.

Generally, in considering the motives which have impelled us to embark on a vigorous program of space exploration, and the benefits which we hope to obtain, we should keep in mind an observation made many years ago by the great French philosopher Henri Bergson, in his book, "Philosophic Intuition." Bergson wrote that "the human mind is so constructed that it cannot begin to understand the new until it has done everything in its power to relate it to the old."

Because this thought is so descriptive of the attitude of my generation, and those which have preceded it, my friends and I usually find ourselves describing the motives of space exploration on the basis of the more practical values. Among these are the vital importance of space leadership to our national defense and

the preservation of our free society, and the specific social, scientific, and economic benefits which will certainly flow from the vigorous effort now underway.

Certainly these are vital considerations which would compel us to seek pre-eminence in space even if no other motives were at hand. Today, however, with the indulgence of your parents who, like myself, may find the dynamic concepts of space exploration difficult to comprehend because, again in Bergson's words, we are "accustomed to thinking of the moving only in terms of the unmoving," I would like to present some less mundane considerations to this graduating class.

With minds uncluttered by any first-hand recollection of the whiffle-tree or the Model T Ford, and accustomed as you are to welcome change, rather than to resist it, you provide me with a rare opportunity to discuss some of the more esoteric motivations of the space program, and the remarkable opportunities which await you as man moves outward into the universe.

Among the more intangible motivations which have prompted us to undertake a bold and aggressive effort to conquer space are two which are either seldom acknowledged or often misunderstood. Simply identified, these are the need to maintain our international position of leadership and the compelling urge of man to explore and discover.

The first of these -- our standing in the minds of other peoples and other nations -- is most often mistakenly associated

with propaganda, and related to the momentary impact of a specific exploit, the achievement of a new "first" in space. Without minimizing the impact of space exploits for propaganda purposes, thoughtful observers have made it clear that the prestige factor in space exploration involves far more than this.

One view of the broader implications of space activity was forcefully expressed recently in an editorial in the Washington Post, which summed up our national obligation in these words:

"An inward looking America was shaken as it seldom has been shaken by the launching of the first Soviet Sputnik in October, 1957. An inward looking America today, either in terms of breaking away from its world responsibilities or in backing away from what are no less its responsibilities to reach into space, also would be a disaster for free men everywhere.

"Force and counter-force," the editorial continued, are present today at every level of human life and human endeavor. With every breakthrough into a new realm, the scope of man's activities is inevitably and irreversibly increased. So it has been at Cape Canaveral. So must it be as man now prepares for the next step farther into space."

Martin Goland, President of the Southwest Research Institute, puts it another way:

"Our age is one of quickening technology," Goland has said, "of economic opportunity accompanied by sharpened domestic and international competition, of changing social patterns and political structures. In the kaleidoscope of this environment, a major

source of strength will be on the side of the nation which is creative and productive; the nation whose people are capable of exploiting for sound purposes the seemingly inexhaustible potential of science and technology."

What these views express are these simple truths. For the first time in the history of mankind the opportunity to leave the earth and explore the solar system is at hand. Only two nations, the United States and the Soviet Union, have the resources with which to exploit this opportunity. Were we, as the symbol of democratic government, to surrender this opportunity to the leading advocate of the Communist ideology, we could no longer stand large in our own image, or in the image that other nations have of us and of the free society we represent.

Like it or not, therefore, the hard facts of international life leave no doubt that we are in a contest with the Soviet Union. Like it or not, it is a fact of international life that space achievement is and will be a symbol of national character and national strength. As one wise man has put it, "prestige is the faculty enabling a great power to avoid final, miserable choices between surrender and war....the ingredient of authority in international affairs," and we must, therefore, demonstrate that we have the capability and determination to carry out those things which we have declared seriously that we intend to do.

Some -- the pure scientists in particular -- regard the idea of a scientific and technological contest between nations as some-

how ignoble or impure. But is it really so? Consider these words of Eugene Rabinowitch, editor of the Bulletin of Atomic Scientists:

"In the last two years, cooperation in space has been the one field in which positive agreement has been achieved between the Soviet Union and the United States. In facing cosmic space, the quarrels and struggles between different factions of humanity appear petty and irrelevant; the dimensions and costs of exploring the solar system -- not to speak of venturing beyond it -- are so enormous, and so obviously call for common effort, that in the midst of the Cold War the need for cooperation impresses itself on nations and their leaders, despite their bitter rivalry and conflict. Common effort could help to create bonds and foster the thrust which comes from participating in a common enterprise."

Rabinowitch concludes:

"If space exploration could help bring together the two alienated parts of humanity and reduce, even slightly, the danger of an all-destroying nuclear war, that alone would make worthwhile investing in it many billions of dollars."

Let me dispose of the topic with one final quotation, from a distinguished scientist, Lloyd Berkner. He said recently:

"Because of this very primitive and deep seated instinct to conquer the unconquered, the space race between the U.S. and the U.S.S.R. is inevitable. Men everywhere see, in the conquest of space, the peaceful demonstration of the superiority of one of the two competing systems of economic organization -- capitalism vs.

communism. The conquest of space has become a symbol of the challenge to each system to demonstrate its superiority.

"Now you may deplore this situation as foolish, or ungentlemanly, or costly, or unintellectual, but that's the way it is, and you'd better accept it if you want to retain our free system.

"I would add parenthetically," Berkner concluded, "that it may be better for both sides to shoot some dollars into space than to shoot them at each other!"

Let us turn now to the second of the less tangible motivations for space exploration, which I have called -- as did President Eisenhower in 1958 -- "the compelling urge of man to explore and discover."

Dr. K. S. Pitzer, President of Rice University, notes that "the aim of the explorer extends to include anything that he can hope to reach.

"Mt. Everest has been defeated and the atom has been split but much remains to be learned about the depths of the sea as well as the mysteries of molecules. The concept of exploring space has a unique grandeur, and we are certainly a privileged generation to be the first in outer space, and hopefully on the moon and the planets."

This search for knowledge and urge to explore the unknown has been, throughout the centuries, the well-spring of civilization. Pitzer notes that "exploration always yields benefits which were far from the mind of the explorer," whether it be geographical

exploration or the exploration which is scientific research. But equal to the specific benefits of exploration, whether foreseen or unforeseen is, in his words, "the strengthening of our pioneer spirit which will lend vigor, imagination, and success to many other ventures."

Berkner notes that "when we look at the catalogue of scientific, civil, and military potentialities of space, they look pretty impressive. But there is another motivation in space exploration that is so important it can't be ignored. That is the aspiration of men to reach out to the stars, to accomplish what men have not accomplished before. This is the very deep, driving force within man, responsible for his evolution from the animal, an innate force that has caused him to rise to unparalleled social accomplishment."

Some daring souls have suggested another aspect of this motivation which is generally overlooked largely, I expect, because few persons have had the courage to advance it. Let me give you an exchange between Detlev Bronk, President of the Rockefeller Institute, and Eric Sevareid, during a recent television forum.

Bronk was making the point that getting to the moon is secondary to "the effort to get there, the human adventure of endeavoring to get there, and the effort of people to understand something they have never been able to understand before."

Said Dr. Bronk: "The vitality we get as a nation out of being engaged in a great adventure -- I think this is the most important thing."



Sevareid commented: "You sounded at first there, as if the fun in this was the great thing."

"I think it is," Bronk replied.

Sevareid retorted that he thought it was "very expensive fun," to which Bronk countered:

"No, I don't think so....I happen to be a member of the Rosetree Fox Hunting Club. It's fun, and I defend the right of the American people to have fun."

Others have commented that a major motivation for going to the planets is the fact that we want to, but that it is difficult to accept doing something because we "want to" as a justification for the expenditure of federal money -- a point with which I, as a federal administrator, must heartily agree. Yet those who sponsor this view deserve a hearing.

Let me give you Dr. A. R. Hibbs, a reputable and responsible mathematician and physicist, as the spokesman for the advocates of interstellar fun.

"Would it not be more healthy (and more honest) if we were to say that we are going to put a man into orbit around the earth, because that is what we want to do? Might this not also contribute to the national prestige? Might it not be worthwhile to show the world that our economy, our political system, our national strength, is so vital that we can afford the indulgence of our national urge toward human adventure and excitement with a program for manned space flight?

"Let me then recall to your mind a picture which I am sure has been there many times before. One day -- a day that is probably farther away than many of us would like to believe, but a day that may be closer at hand than many of our conservative cohorts are ready to admit -- one day, a mammoth rocket with a man in its nose will pursue its thundering logarithmic history beyond the speed of escape; and, until the successful burnout of the last stage, the whole world will hold its breath.

"On that day, the first human being to head for Mars will begin the long, silent month of weightless coasting, and, regardless of the uniform he wears, his payload will carry neither gun nor bomb. In the months that follow, he will describe to his earthbound neighbors the panorama of the universe; and it will not matter whether or not he reports a single scientific observation. One day a capsule carrying a man will streak down through the atmosphere of Mars, and the incandescent trail which follows that capsule across the Martian sky will illuminate the hopes and dreams of two billion human beings.

"There will come a day when the first man stands erect on the red sands of Mars -- and you and I can help him do it.

"Perhaps we will help him because of the scientific enlightenment which will result from his exploration. Perhaps we will be trying to strengthen the national military posture or add to the national prestige. But is it not possible that we will help simply because we want a man to stand on Mars?"

Most of us would have difficulty, despite the dramatic vision of Dr. Hibbs, in justifying our space program on grounds of pleasure alone. None, of us, however, can fail to be stirred by the challenge of the unknown. Perhaps this has been stated best of all in the words of the explorer, Fridtjof Nansen, which are chiseled in oak above the entrance to the library of Carleton College. They read:

"The history of the human race is a continuous struggle from darkness toward light. It is therefore of no purpose to discuss the uses of knowledge -- man wants to know and when he ceases to do so he is no longer man."

But what will this thrust of human curiosity, this new venture in exploration which will free man from the earth, and take him to the moon and the planets, mean to you?

Here at the University of Delaware you have learned that all that we value most is a product of, or intimately related to the human mind, and that most of the instruments and institutions of human progress are quite recent developments in the long history of mankind.

There is the art of writing, which we have enjoyed for some 6,000 years; agriculture, only a little longer; Christianity, less than 2,000 years; modern science, about 300 years old, and modern technology, as revolutionized by science, developed over only about 150 years.

In the explosive development of man's knowledge of the universe in which we live, through use of his mind, consider this series of events.

In 1632, or just 330 years ago, the Cardinals who passed sentence on Galileo asserted that "the proposition that the earth is not the centre of the world and immovable, but that it moves....is absurd and false."

But 200 years later man had learned, and had come to accept, that the earth is not the center of the universe, and beyond that, that the sun also is not the center of the universe. Instead, it was recognized and accepted that the universe itself is in motion, and that we here on earth are ourselves on a spacecraft traveling at 67,000 miles an hour in a path around the sun. This will place us, six months from now, 180,000,000 miles from where we are today -- that is, with reference to the sun, which also moves.

The changes wrought by science and technology during the first half of this century were enormous, as were the social and economic upheavals which they produced, and the legislative reforms which were enacted to deal with them.

But all of this has been transcended by the accelerating forces of change in the world in which we live today. We are dealing not only with profound changes in the social and economic structure of our country and the world; we are dealing as well with an even more profound change in man's own conception of the boundaries and limitations of his habitable environment and his understanding of the forces of the universe.

Throughout human history, as Bergson said, men have been accustomed to think of the moving only in terms of the unmoving.

But your generation will find it easier to think of itself as a part of a dynamic universe because John Glenn and others have, before the eyes of all men, demonstrated the emerging cosmology of Von Braun, Van Allen, Dryden and Pickering.

It might be said that almost all that man knows about this vast universe that is his home he has learned from the examination of one material, that of earth; one form of life, that of earth; the characteristics of one body in space, those of earth -- its gravitation, magnetic fields, trapped radiation, atmosphere and magnetosphere.

Now man is going out to get a second material to compare with that of earth -- that of the moon, and perhaps a third, that of Mars.

And with Mariner's measurements of some of the characteristics of Venus, the mind of man, for the first time, can compare the magnetic fields of his earth with those of another body in space. And as more Mariners travel to other planets, he will have their measurements to compare with those of earth, much as lawyers sharpen up points at issue through studies in comparative law.

Finally, many believe man will achieve the most exciting prospect of all -- that he will find extra-terrestrial life to compare with his own.

In your lifetime, just ten years ago, man grappled with a shrunken and bipolarized world, exploiting an atmospheric medium little more than twice the height of his tallest mountains. Yet

little more than ten years hence your generation will have stood on the moon, looking back at the earth, while confidently preparing to voyage to nearby planets in this solar system.

To me -- to your parents -- this prospect is overwhelming. To you, who will carry the banner in the greatest advance in the history of civilized man, it represents an opportunity to extend man's vision into new dimensions and to help write your own parts in the drama of creation.

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